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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,352	09/28/2000	Clinton A. Staley	08822-050001	7756

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EXAMINER
WONG, ALLEN C

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<table>
<tr>
<td rowspan="2">Office Action Summary</td>
<td>Application No.
09/672,352</td>
<td>Applicant(s)
STALEY ET AL.</td>
<td></td>
</tr>
<tr>
<td>Examiner
Allen Wong</td>
<td>Art Unit
2613</td>
<td></td>
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</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>14 March 2005</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-6,8-19,21 and 23-31* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-6,8-19,21 and 23-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments with respect to claims 1, 16 and 19 have been considered

but are moot in view of the new ground(s) of rejection.

     A 35 U.S.C. 101 rejection should have been done in the previous rejection. Now,

a new non-final rejection is presented below. Claim 19 is written in such a manner that

a program storage media can be reasonably interpreted as containing instructions to be

listed or written as a computer program coded language on a piece of paper. Because

of the ambiguous nature of the claims as currently written in the preamble of claim 19,

claim 19 needs to be produced in a tangible body, machine readable, and be non-

function descriptive material, meaning that a compressed signal needs to be produced

by a method, apparatus, arrangement or system. So claim 19 needs to be cancelled to

overcome the 35 U.S.C. 101 rejection. The preamble needs to disclose "a computer-

readable storage media storing computer program including executable instructions, the

instructions to cause a computer to:". See MPEP 706.03(a).

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

     Claim 19 is rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. Claim 19 is written in such a manner that a

program storage media can be reasonably interpreted as containing instructions to be

listed as computer program coded language on a piece of paper. Because of the

ambiguous nature of the claims as currently written in the preamble of claim 19, claim

19 needs to be produced in a tangible body, machine readable, and be non-function

descriptive material, meaning that a compressed signal needs to be produced by a

method, apparatus, arrangement or system. So claim 19 needs to be cancelled to

overcome the 35 U.S.C. 101 rejection. The preamble needs to disclose "a computer-

readable storage media storing computer program including executable instructions, the

instructions to cause a computer to:". See MPEP 706.03(a).

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1, 4-6, 8, 12-14, 16-19, 21, 23 and 26-31 are rejected under 35 U.S.C.

103(a) as being unpatentable over Lim (5,638,126) in view of Linzer (6,038,256).

Regarding claims 1 and 19, Lim discloses a program storage media storing

computer executable instructions, the instructions to cause a computer to:

estimate forms of a plurality of functions, each function relating encoded size to

encoded quality for each frame in a sequence of frames, each frame having data for an

image (fig.1, element 10 is the controller connected to the buffer 120 that receives

various sizes or amounts of frame image data encoded by coder 110, where a

sequence of frames is sent through the encoding system of fig.1 in that since Lim's

invention uses an MPEG encoder for encoding a plurality of images, I, P and B frames,

each frame within that sequence of frames (GOP) have different sizes, and further, note

quantization controller 10, there is a selector 160 that decides which quantization

parameter to use on the evaluated frame(s) in order to properly allocate the number of

bits to the evaluated frame(s) for efficient coding);

perform a search of all frames in the sequence of frames for a best quality value

for encoding the sequence of frames whose encoded sizes satisfy one or more

constraints, the constraints being associated with one or more of a transmission line

bandwidth, a receiver buffer size and a total size constraint, the estimating a best quality

value being based in part on the functions (fig.1, element 10 is the controller connected

to the buffer 120 that receives various sizes or amounts of frame image data encoded

by coder 110, where the process of generating the encoded data at an acceptable bit

rate for transmission in that a recursive process is done to monitor the quality of the

encoded bit frames by checking on the buffer fullness to determine the total size

constraint, and note Qp adjuster 130 adjusts the quality of the encoded frames and

element 160 selects the best quality value Qp, thus, best quality value is ascertained;

see col.3, ln.47-53);

encode each frame of the entire sequence of frames with the best quality value

(fig.1, note Qp adjuster 130 adjusts the quality of the encoded frames and element 160

selects the best quality value Qp, and coder 110 utilizes the information from

quantization parameter deciding block 10 for coding with the best quality value);

determine whether each encoded frame satisfies the constraints (fig.1, note a

recursive process is done to monitor the quality of the encoded bit frames by checking

on the buffer fullness to determine the total size constraint to determine whether the

frame satisfies the constraints); and

if the encoded frames satisfy the constraints, order transmission of frames of the

sequence (fig.1, note data from buffer 120 is transmitted to transmission for

transmission of frames of the sequence of images).

Lim does not specifically disclose the prior to encoding any of the frames that

performs a search of all frames in the sequence of frames for a best quality value.

However, Linzer teaches that prior to encoding any of the frames, there is an execution

of searching of all the frames prior to encoding any of the frames (fig.3, element 24 and

col.5, ln.63-67 and col.6, ln.9-13 and ln.25-26, note the statistics gatherer 24 obtains a

search of all the frames from the video sources to obtain a best quality value prior to

encoding any of the frames). Therefore, it would have been obvious to one of ordinary

skill in the art to combine the teachings of Lim and Linzer, together as a whole, for

gathering all of the possible pre-encoding data so as to efficiently encoding high quality

images in an accurate, precise manner (Linzer col.3, ln.64 to col.4, ln.13).

Note claims 4-6, 12-14, 21 and 26-31 have similar corresponding elements.

Regarding claims 8 and 23, Lim discloses the encoded frames are from a group

of temporally encoded pictures (Lim's invention uses an MPEG encoder for encoding a

sequence of images wherein the plurality of images are I, P and B frames, and that

these are temporal).

Regarding claim 16, Lim discloses a system for encoding image frames, the

system comprising:

a controller connected to receive data on sizes on image frames that are part of a

sequence of image frames (fig.1, element 10), to be encoded by the encoder and to

control quality of the encoded frames produced by the encoder based on:

an estimation of forms of a plurality of functions, each function relating encoding

size to encoded quality for each frame in the sequence of frames (fig.1, element 10 is

the controller connected to the buffer 120 that receives various sizes or amounts of

frame image data encoded by coder 110, where a sequence of frames is sent through

the encoding system of fig.1 in that since Lim's invention uses an MPEG encoder for

encoding a plurality of images, I, P and B frames, each frame within that sequence of

frames (GOP) have different sizes, and further, note quantization controller 10, there is

a selector 160 that decides which quantization parameter to use on the evaluated

frame(s) in order to properly allocate the number of bits to the evaluated frame(s) for

efficient coding);

a search of all frames in the sequence of frames for a best quality value for

encoding the sequence of frames whose encoded sizes satisfy one or more constraints,

the constraints being associated with one of a bandwidth of a transmission line, space

in a receiver buffer and a total compressed size (fig.1, element 10 is the controller

connected to the buffer 120 that receives various sizes or amounts of frame image data

encoded by coder 110, where the process of generating the encoded data at an

acceptable bit rate for transmission in that a recursive process is done to monitor the

quality of the encoded bit frames by checking on the buffer fullness to determine the

total size constraint, and note Qp adjuster 130 adjusts the quality of the encoded frames

and element 160 selects the best quality value Qp, thus, best quality value is

ascertained; see col.3, ln.47-53); and

a variable bit rate encoder controlled by the controller configured to encode each

frame of the entire sequence of frames with the best quality value, wherein the

controller is further configured to determine whether each encoded frame satisfies the

constraints, and if the encoded frames satisfy the constraints, transmitting the sequence

of encoded frames (fig., element 110 is the variable bit rate encoder controlled by the

controller 10 connected to the buffer 120 that receives various sizes or amounts of

frame image data encoded by coder 110, where the process of generating the encoded

data at an acceptable bit rate for transmission in that a recursive process is done to

monitor the quality of the encoded bit frames by checking on the buffer fullness to

determine the total size constraint, and note Qp adjuster 130 adjusts the quality of the

encoded frames and element 160 selects the best quality value Qp, thus, best quality

value is ascertained; see col.3, ln.47-53).

Lim does not specifically disclose the *prior to encoding* any of the frames that

performs a search of all frames in the sequence of frames for a best quality value.

However, Linzer teaches that prior to encoding any of the frames, there is an execution

of searching of all the frames prior to encoding any of the frames (fig.3, element 24 and

col.5, ln.63-67 and col.6, ln.9-13 and ln.25-26, note the statistics gatherer 24 obtains a

search of all the frames from the video sources to obtain a best quality value prior to

encoding any of the frames). Therefore, it would have been obvious to one of ordinary

skill in the art to combine the teachings of Lim and Linzer, together as a whole, for

gathering all of the possible pre-encoding data so as to efficiently encoding high quality

images in an accurate, precise manner (Linzer col.3, In.64 to col.4, In.13).

Regarding claim 17, Lim discloses wherein the controller is configured to

determine a relation between quality of an encoded image frame and amount of

encoded data from the received size data (col.3, In.47-53 and fig.1, note Qp adjuster

130 adjusts the quality of the encoded frames and element 160 selects the best quality

value Qp based on the data obtained from the buffer 120).

Regarding claim 18, Lim discloses wherein the controller is configured to

determine a best quality value for encoding an image frame from size data on data

frames encoded with different qualities (fig.1, element 10 is the controller connected to

the buffer 120 that receives various sizes or amounts of frame image data encoded by

coder 110, where the process of generating the encoded data at an acceptable bit rate

for transmission in that a recursive process is done to monitor the quality of the encoded

bit frames by checking on the buffer fullness to determine the total size constraint, and

note Qp adjuster 130 adjusts the quality of the encoded frames and element 160 selects

the best quality value Qp; see col.3, In.47-53).

Claims 9-11, 15 and 24-25 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lim (5,638,126) Linzer (6,038,256) and in view of Gonzales

(5,231,484).

Regarding claims 9-11, 15 and 24-25, Lim does not specifically disclose wherein

each instruction to estimate one of the forms, further causes the computer to: compute

a plurality of pairs of encoded quality and encoded size values for each frame of the

sequence from encoded frame data; and determine a functional relationship between values of the encoded quality and the encoded size for the plurality of frames from the pairs of values. However, Gonzales teaches the calculation of the pairs of quantization parameters for each frame with their respective encoded size values (col.21, ln.3-33; note the QP_{low} has two different values calculated for the different values of the picture, where delta u is the upper limit and delta l is the lower limit for the allocation of bits for the picture or frame, and note that there is a function relationship between the values of the encoded quality and the encoded size of the frames as shown by formula for QP_{low}). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lim and Gonzales, as a whole, for providing optimal visual quality when encoding picture or frame data in an accurate, efficient manner (Gonzales col.8, ln.29-38).
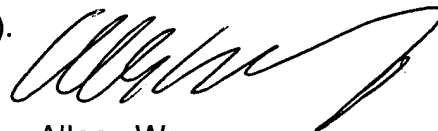
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Business Center (EBC) at 866-217-9197 (toll-free).

Allen   Wong
Primary Examiner
Art Unit 2613

AW
6/27/05